Special Problem 5.5-7

For the circuit below, V_G is the DC bias at the gate, v_i is the small-signal input and v_o the small-signal output. The transistor is known to be in the **saturation** region.

The **capacitor** in the circuit is **extremely large**.

1) Draw the resulting **small-signal** circuit.

2) In terms of transconductance g_m, find the small-signal **gain** $A_v = v_o/v_i$.

NOTE: Do **not** attempt any **DC analysis**; provide your solutions directly in terms of g_m. Ignore the output resistance (i.e., $r_o = \infty$).